# PRESENTS

# Special Effects Lighting on your railroad

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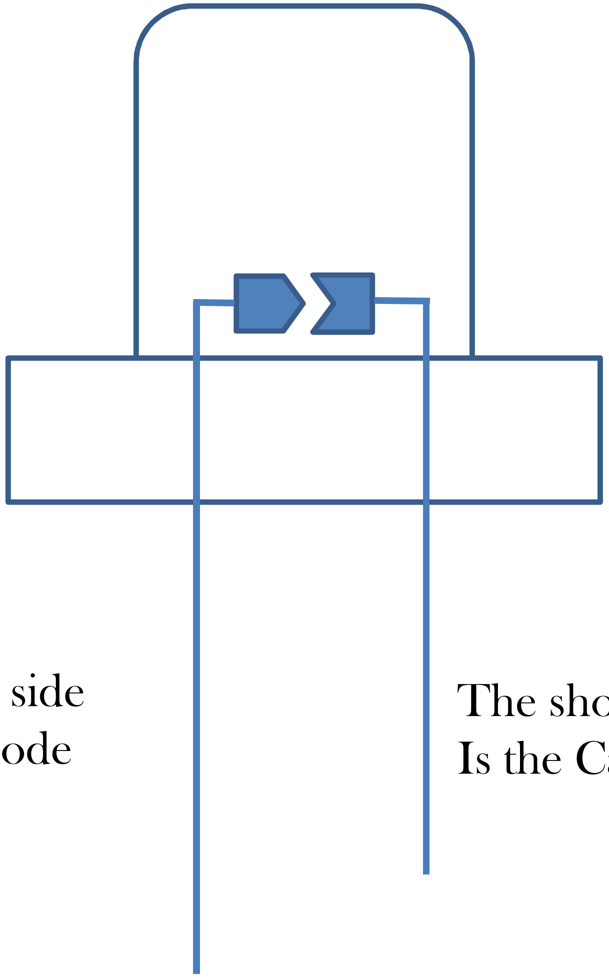
# SPECIAL EFFECTS LIGHTING...

What type of lighting works for special effects on a model railroad?  Depends on what you are trying to do.  I like to work with LEDs (Light Emitting Diode) as much as possible.  These draw VERY little power, create no heat and last for a long, LONG time.  These come in various sizes and colors now as well.  Regular light bulbs, like a grain of wheat bulb still have their uses but also offer some limitations (namely their lack of longevity and the heat they can create).

First we will talk about LEDs to cover how they work and some special things that can be done with them.

# Standard LED



The long side
Is the Anode

The short side
Is the Cathode

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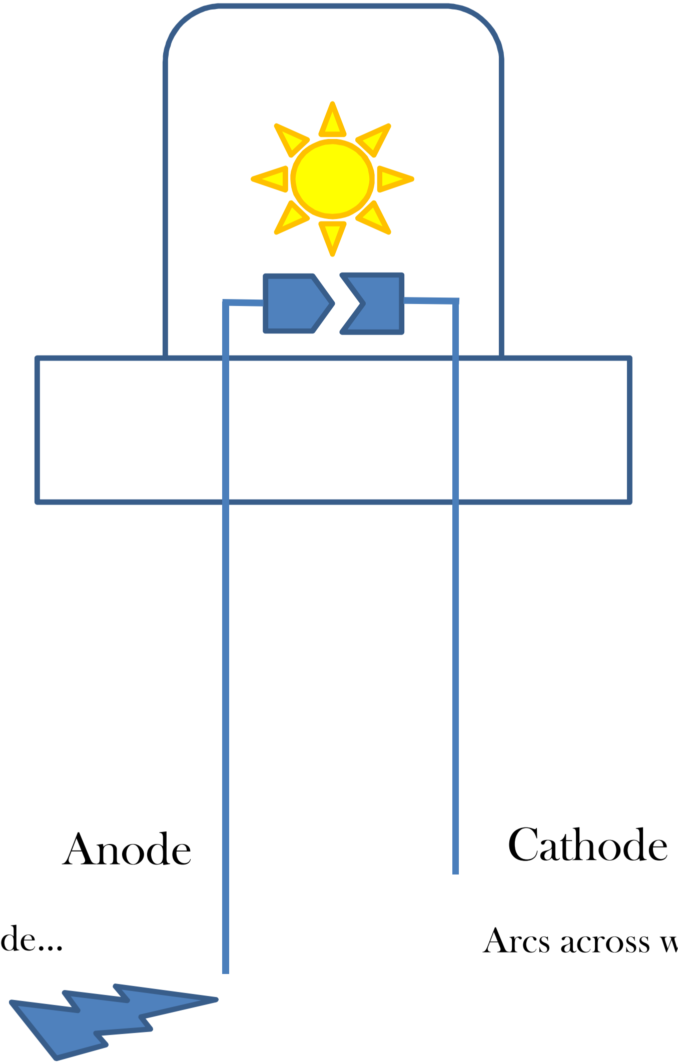
# Standard LED



Power comes in from one side…

Arcs across which creates light…

A standard LED will only light up if the power comes in from the correct side.
If you don't get light simply reverse the wires between the Anode and Cathode.

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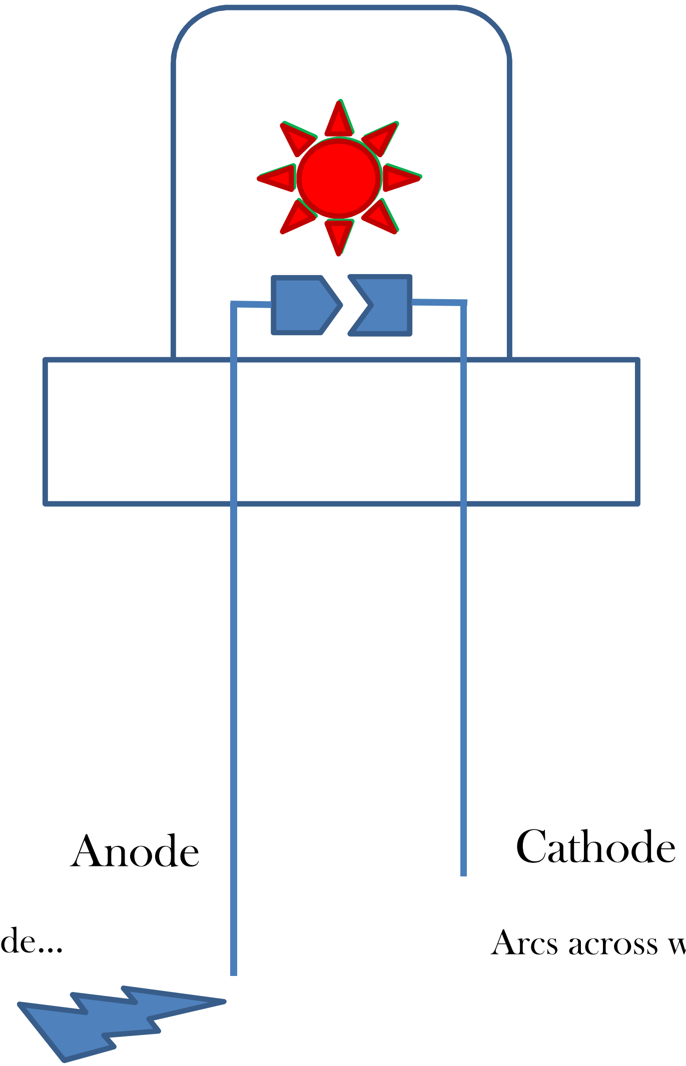
# Bi-Colored LED



Power comes in from one side...

Arcs across which creates light...

If you reverse the wires between the Anode and Cathode the LED light changes color.

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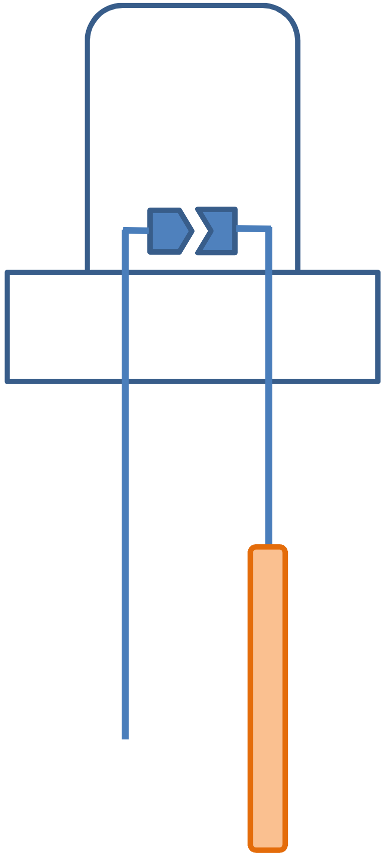


Often a Resistor is needed to control the voltage through the LED. An LED light can be dimmed or made brighter by adding or subtracting resistance.

Too much power and it lets out the magic smoke and stays dark forever. An LED tester is a real help in determining what resistor you might need.

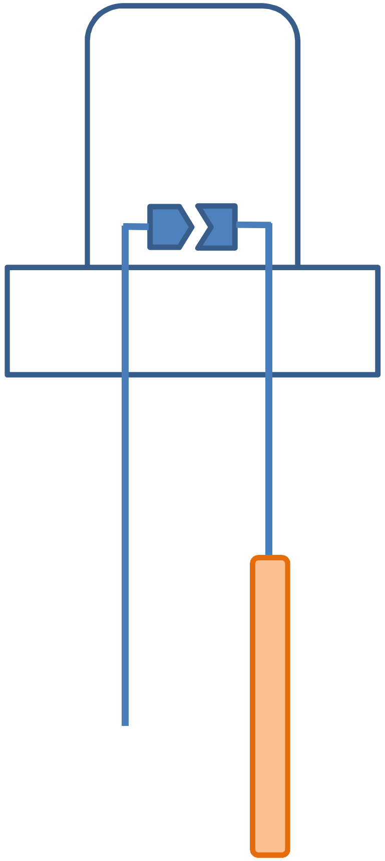
Adding some heat shrink over the other leg can keep you Anode from touching the Cathode which will short out the LED

1000 Ohm (1K) resistor results in a very bright light.
1500 (1.5 K) Ohm is good for a new locomotive headlight
2.7 K is good for an old oil type locomotive headlight.
3.5 K is good for kerosene lamps or hand held lanterns

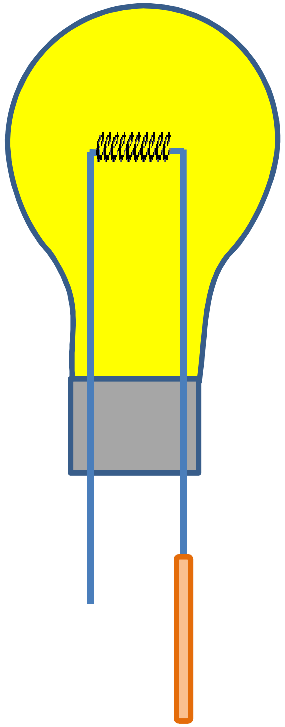
Drill into the tower of the LED with a 3mm bit.  Use CA and glue in fiber optic cable into the holes.

DO NOT drill deep enough to get to the light package.

Put a piece of heat shrink over the ends of the cable and the LED.  This will focus the light from the LED into the fiber optics.  DO NOT apply heat to shrink the heat shrink.  The fiber optic cable is also very susceptible to heat and will melt along with the heat shrink tube



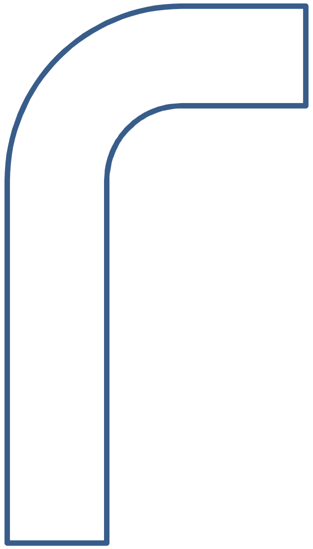
Common fiber optic sizes that are useful In HO are .75mm, 1mm and 1.5mm



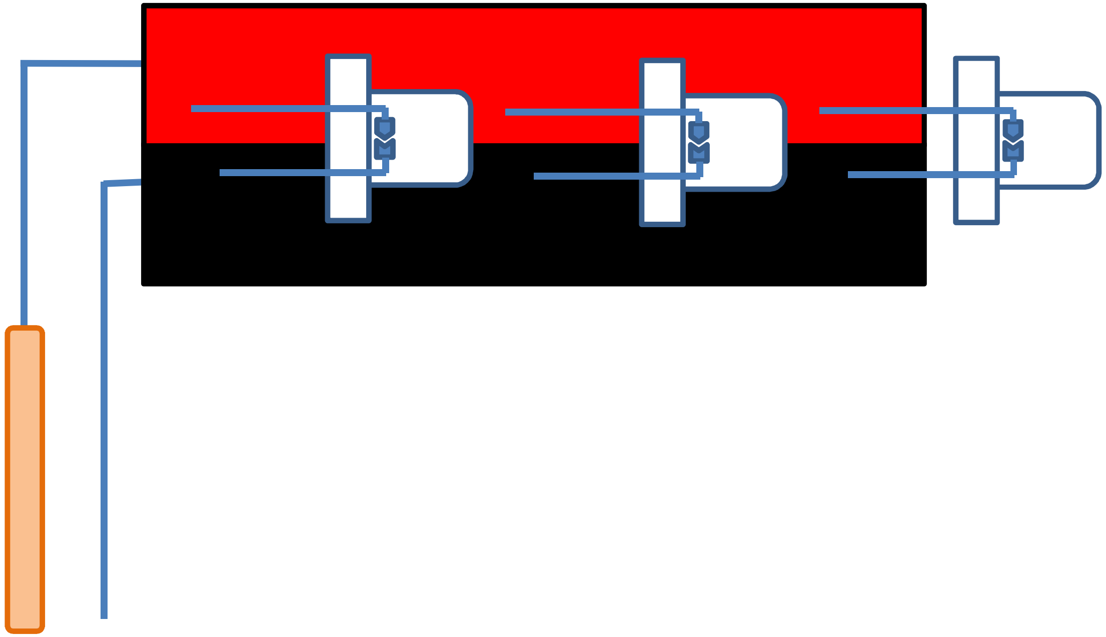
A regular light bulb works the same way.  Power comes in one side, goes out the other but as it gives off light it also creates heat.  The lifespan of a light bulb is much shorter than an LED so you will have to plan your project so that you can replace the bulb at some point in the future.

In the case of a structure, the easiest way to do this is to have either the roof come off the building or have the building be removable from the layout so you can have access from the bottom.  Having the building be removable is a problem because it will not look like it's 'planted' but will just sit on top of the ground.  This creates what we call the Dorothy effect where the house just landed.  With this in mind a removable roof is the best option.

When the roof can't be removed the best way to get to a bulb is to feed it up through a straw and into the building.  This will allow you to pull the burnt out bulb down through the straw to remove it from the layout.



Lights, both LED and bulbs, can be hooked up in series so that you can put multiple lights on the same power feed. This is really handy for lighting large structures like a roundhouse. For this I found the speaker wire works really well. A small cut can be made in the wire and one leg of the LED or bulb can be inserted into each wire. The creates a nice wiring buss for you light circuit. Lights can be spaced however you need them.



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One way to get more realism in your lighting is to vary the types of bulbs and or LEDs along with various voltages so that the lights aren't all the same color, size and brightness.  In large structures most of the lights would be of the same type but a slightly different one here or there is a good thing.  When running lights to various buildings in a town you will always want to vary the lights around so that they are all different from one building to the next.  Lights on their own are a wonderful effect but by using various colors and brightness levels you can create a realistic lighting effect for your railroad.

# Questions?

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# Thanks!